

REMARKS

Claims 15, 16, 21-23, 25-32, and 35 are now pending in the application. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the amendments and remarks contained herein.

REJECTION UNDER 35 U.S.C. § 102

Claims 33 and 34 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Uchiyama 6,265,770 (U.S. Pat. No. 6,265,770; hereinafter Uchiyama '770). This rejection is respectfully traversed.

Claims 33 and 34 are cancelled. This rejection, therefore, is moot. Accordingly, withdrawal of this rejection is respectfully requested.

REJECTION UNDER 35 U.S.C. § 103

Claims 15, 16, 21-23 and 25-32 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Uchiyama (U.S. Pat. No. 6,265,770; hereinafter Uchiyama '770) in view of Uchiyama (U.S. Pat. No. 5,847,796; hereinafter Uchiyama '796). This rejection is respectfully traversed.

The Examiner alleges that Uchiyama '770 teaches the claimed methods of claims 15 and 21 substantially as claimed, but fails to teach a step of thermocompression-bonding a second component to a substrate with a compression bonding head, wherein the band region is wider than the head. Notwithstanding, the Examiner alleges that Uchiyama '796 teaches a method of bonding a driver IC with a bonding tool or compression bonding head that is slightly wider than the driver IC but

much smaller than a band region or upper service of the substrate in order to have a more uniform load at a more uniform temperature of bonding. The Examiner, therefore, further alleges that it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Uchiyama '770 and Uchiyama '796 to arrive at the claimed invention. Applicant respectfully asserts, however, that Uchiyama '796 does not teach a bonding head that is narrower than the band region.

More specifically, the present invention is directed to a method of bonding multiple components onto a surface of a substrate. In this regard, first components are bonded onto a surface of a substrate in first regions by a soldering method. These components are bonded to the substrate via a solder connection before a second component is bonded to the substrate in another region by an anisotropic conductive film. Because the temperatures for soldering and bonding an anisotropic conductive film are different, the inventors of the present invention sought a method whereby multiple components could be bonded in an orderly fashion while still ensuring reliable connection to the substrate.

In this regard, the first components which are connected to the substrate via a solder connection are bonded to the substrate first. The components are soldered to the substrate and then put into a furnace whereby the solder is melted and the connection of the components to the substrate is thereby maintained. After the soldering process has been completed, the claimed second component is disposed on an anisotropic conductive film and thereby bonded to the substrate by thermocompression-bonding the second component and anisotropic conductive film to the substrate. What is significant and novel about this process, however, is that the

second component is disposed in a band region that is flanked on either side by the first regions that include the first components. Furthermore, the thermocompression bonding head is narrower than the claimed band region. As such, when the second component is bonded to the substrate in the band region, the first components which have already been soldered to the substrate in first regions that are outside of the claimed band region do not interfere with the thermocompression bonding. In other words, there is no danger of the thermocompression bonding head coming into contact with the first components such that these components can become dislodged or prevent the bonding head from reliably contacting the second component (see *e.g.* paragraph [0005] of the specification). The second component, therefore, is also reliably bonded to the substrate.

In contrast to the claimed invention, both Uchiyama '770 and Uchiyama '796 are silent with respect to the claimed band region. Furthermore, assuming *arguendo* that Uchiyama '770 teaches the claimed band region as alleged by the Examiner, Uchiyama '796 still fails to teach a thermocompression bonding head that is narrower than the band region. This is because, as shown in Figures 3, 5, 6, 8, 10, 11, 12, and 14 of Uchiyama '796, the bonding head 4 is larger than a distance from the edge of the substrate 62 to the edge of the second substrate 63. Accordingly, utilizing the Uchiyama '796's teaching of a wide bonding head 4, the second substrate 36 still presents a risk of interfering with the bonding of the IC chip 61 to the substrate 62 because the wide bonding head can come into contact with the second substrate 63. This teaches directly away from the claimed invention.

Because Uchiyama '796 teaches a bonding head that is contrary to the claimed invention, Applicant respectfully asserts that the claimed invention would not have been obvious. Reconsideration and withdrawal of this rejection, therefore, is respectfully requested.

NEW CLAIM

New claim 35 has been added. New claim 35 is described throughout the specification and drawings as originally filed. No new matter has been added. New claim 35 is neither anticipated nor obvious for at least the same reasons as stated above for both independent claims 15 and 21. Namely, neither Uchiyama reference teaches the claimed band region nor the claimed thermocompression-bonding head. Favorable consideration of this new claim is respectfully requested.

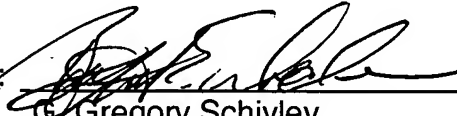
CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the

Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

Dated: August 9, 2005

By: 
G. Gregory Schivley
Reg. No. 27,382
Bryant E. Wade
Reg. No. 40,344

HARNESS, DICKEY & PIERCE, P.L.C.
P.O. Box 828
Bloomfield Hills, Michigan 48303
(248) 641-1600

GGG/BEW/JAH